

REBUTTAL TESTIMONY

OF

BRIAN HORII

ON BEHALF OF THE

SOUTH CAROLINA OFFICE OF REGULATORY STAFF

DOCKET NO. 2019-182-E

IN RE: SOUTH CAROLINA ENERGY FREEDOM ACT (H.3659)

PROCEEDING INITIATED PURSUANT TO S.C. CODE ANN. SECTION 58-

40-20(C): GENERIC DOCKET TO (1) INVESTIGATE AND DETERMINE

THE COSTS AND BENEFITS OF THE CURRENT NET ENERGY

METERING PROGRAM AND (2) ESTABLISH A METHODOLOGY FOR

CALCULATING THE VALUE OF THE ENERGY PRODUCED BY

CUSTOMER-GENERATORS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND OCCUPATION.

My name is Brian Horii. My business address is 44 Montgomery Street, San Francisco, California 94104. I am a Senior Partner with Energy and Environmental Economics, Inc. ("E3"). Founded in 1989, E3 is an energy consulting firm with expertise in helping utilities, regulators, policy makers, developers, and investors make the best strategic decisions possible as they implement new public policies, respond to technological advances, and address customers' shifting expectations.

Q. DID YOU FILE DIRECT TESTIMONY AND EXHIBITS RELATED TO THIS PROCEEDING?

1 **A.** Yes. I filed direct testimony and exhibits with the Public Service Commission of
2 South Carolina (“Commission”) on October 8, 2020.

3 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

4 **A.** My rebuttal testimony addresses the direct testimonies of Dominion Energy South
5 Carolina, Inc. (“DESC”) witness Margot Everett and witnesses for the South Carolina
6 Coastal Conservation League, Upstate Forever, Southern Alliance for Clean Energy, Vote
7 Solar and the Solar Energy Industries Association, and the North Carolina Sustainable
8 Energy Association, Justin R. Barnes and R. Thomas Beach.

9 Specifically, I address three (3) issues discussed in DESC witness Everett’s direct
10 testimony: 1) the position that inclusion of externality costs will increase utility costs; 2)
11 the shortcomings in DESC’s use of distribution losses and the use of a 15-year levelized
12 capacity cost for a 20-year cost benefit analysis; and 3) DESC’s incorrect definition of the
13 utility cost test (“UCT”).

14 I address several issues raised by witnesses Barnes and Beach including the
15 potential for resiliency benefits, the claim that the UCT should be used to represent the
16 effect on non-participating ratepayers instead of the Ratepayer Impact Measure (“RIM”)
17 test, and the concerns that customer generators should not be placed in their own rate class.

18 **I. REBUTTAL TO DIRECT TESTIMONY OF MARGOT EVERETT**

19 **Q. DO YOU AGREE WITH WITNESS EVERETT THAT DISTRIBUTION LOSS**
20 **FACTORS SHOULD NOT BE APPLIED TO VOLUMES OF SOLAR ENERGY**
21 **EXPORTS (EVERETT, P. 17)?**

1 **A.** No. While I agree that distribution losses may be different for energy delivered to
2 the customer and solar energy exported (“exports”) by the customer, DESC has not
3 provided any evidence the distribution losses are zero (0) for exports. In fact, exports would
4 reduce distribution system losses to the extent that demand on substations and feeders are
5 reduced by the exports from behind-the-meter solar. On the other hand, export power that
6 flows upward toward the distribution substation then down through the distribution system
7 to another customer will be subject to the same losses that grid power would encounter on
8 that “downward” leg. Solar exports would not avoid that portion of distribution losses.

9 Given the lack of an analysis of the distribution loss impacts for exports, I believe
10 it is necessary to assume a reasonable loss amount that falls between 0% and 100% of the
11 current distribution loss factors. I recommend that until better information can be provided,
12 we “split the difference” and use 50% of the normal distribution losses for solar export
13 volumes.

14 **Q. WITNESS EVERETT STATES THAT “IF ... “EXTERNALITY COSTS” ARE**
15 **INCLUDED IN SETTING RATES UNDER A NEM PROGRAM --- THUS**
16 **INCLUDED IN THE COMPENSATION TO CUSTOMERS WHO INSTALL**
17 **GENERATION RESOURCES BEHIND THE METER --- UTILITIES’ COSTS**
18 **WILL INCREASE ALONG WITH THE RATES.” (P. 19) IS THIS STATEMENT**
19 **ACCURATE?**

20 **A.** No, the statement by witness Everett is not accurate. The Commission has
21 established dockets in which the utilities will develop Solar Choice Metering Tariffs to
22 specify both cost and compensation methods attributed to solar customers. The

1 compensation for solar customers under the new rates will affect bill levels for different
2 customers, but the compensation for solar customers will not change the total costs that
3 utilities can collect from all customers. It is true the installation of solar will change utility
4 costs, but how that solar is compensated does not affect those costs.

5 For example, consider a local coffee shop that charges five (5) dollars for a regular
6 cup of coffee, but gives customers a one (1) dollar discount if the customer brings their
7 own mug instead of receiving a takeout cup. Now assume the coffee shop wishes to be
8 more environmentally responsible and decides to give customers a two (2) dollar discount
9 for bringing their own mug. The coffee shop's costs have not changed --- rent, coffee bean,
10 electricity prices, etc. remain the same. If more customers avoid the takeout cup because
11 of the discount, then the coffee shop's takeout cup supply costs will decline, but there is
12 no cost increase for the coffee shop due to the additional one (1) dollar discount. The coffee
13 shop may need to increase prices for regular customers that require a takeout cup, but that
14 is not an increase to total coffee shop costs, only an adjustment in pricing between regular
15 customers and those that bring their own mugs.

16 In summary, the incorporation of externality costs into the determination of the
17 compensation will not affect total utility costs but may impact the individual bills for
18 participants and non-participants.

19 **Q. TABLE 7 OF WITNESS EVERETT'S TESTIMONY SHOWS SELF-**
20 **GENERATION BILL SAVINGS, EXPORT CREDITS, AND EXPORT CARRY-**
21 **OVER BENEFIT AS COSTS UNDER THE UCT. SHOULD THESE BE**
22 **INCLUDED IN THE UCT?**

1 **A.** No, because the export credits and export carry-over benefits are considered bill
2 savings to the customer with behind-the-meter solar. Bill savings are included as
3 components in the RIM test, but not in the UCT as used in the industry and codified in
4 sources such as the California Standard Practice Manual (“SPM”).¹ DESC includes the
5 bill savings components in the UCT test because DESC mischaracterizes bill savings as
6 “customer incentives.” Customer incentive payments are valid UCT costs, but bill savings
7 are transfer payments, not incentives. It is a somewhat fine point, but the SPM explicitly
8 states that:

9 In this test, revenue shifts are viewed as a transfer payment between
10 participants and all ratepayers. Though a shift in revenue affects rates, it
11 does not affect revenue requirements, which are defined as the difference
12 between the net marginal energy and capacity costs avoided and program
13 costs. (SPM, p. 23)

14 The SPM further goes on to state that:

15 the Program Administrator Cost test treats revenue shifts as transfer
16 payments, meaning that test results are not complicated by the uncertainties
17 associated with long-term rate projections and associated rate design
18 assumptions. (SPM, p. 24)

19 Therefore, bill savings should be excluded from the UCT because 1) to exclude bill savings
20 is consistent with common industry practice (as evidenced by the SPM), and 2) exclusion
21 would properly reflect that while bill savings are “incentives” to customers, they are
22 transfer payments between utility customers and do not affect total utility costs, which is
23 what the UCT is designed to measure.

¹ Note that the UCT test is called the Program Administrator Cost test in the October 2001 update of the California Standard Practice Manual. <https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=7741>

Q. PAGE 34 OF WITNESS EVERETT’S TESTIMONY SHOWS NET BENEFITS OF ZERO (0) FOR RESIDENTIAL AND SMALL COMMERCIAL CUSTOMERS UNDER THE UCT. PLEASE EXPLAIN WHY THE COMMISSION SHOULD NOT RELY UPON UCT RESULTS CALCULATED IN THIS MANNER.

A. DESC’s erroneous inclusion of bill savings components in the UCT renders the results of the UCT meaningless. The erroneous UCT is basically saying that solar has no impact on the utility because customers in aggregate will pay for any changes in utility costs. This flawed approach defeats the purpose of the UCT which is to determine if procurement via the candidate technology (e.g.: behind-the-meter solar) is more or less costly than standard utility resource options.

Q. WITNESS EVERETT STATES THAT DESC USED THE CURRENT NET ENERGY METERING (“NEM”) METHODOLOGY 15-YEAR LEVELIZED VALUE FOR EVERY YEAR OF THE 20-YEAR TERM OF THE EVALUATION PERIOD FOR THE COST BENEFIT ANALYSIS (EVERETT, P. 27). PLEASE EXPLAIN THE PROBLEM WITH THE USE OF THE 15-YEAR LEVELIZED VALUE FROM THE CURRENT NEM METHODOLOGY.

A. The use of the 15-year levelized value may underestimate the capacity value of distributed energy resources (“DER”). Capacity value is typically low or zero (0) in near years and increases further out in time. By using the 15-year levelized value for all twenty (20) years, DESC would likely be underestimating the value of capacity in years sixteen through twenty (16-20). Consider the simple example shown below in Table 1. In this case, there is no capacity value in years one (1) through five (5), and a capacity value of \$100

per kilowatt per year (“kW-yr.”) every year thereafter. Using a 15-year period, the levelized value of capacity is \$53.35/kW-yr. However, extending the period to twenty (20) years yields a levelized value of \$59.33/kW-yr. Under DESC’s proposed approach, the \$53.35/kW-yr. levelized value would be used for all twenty (20) years of the cost effectiveness analysis. However, using the correct \$59.33/kW-yr. value, which would also be used for all twenty (20) years, would result in an 11% increase in capacity value. DESC should be required to reflect the correctly calculated capacity cost that reflects the full analysis period in the cost effectiveness analysis.

Table 1: 15 vs 20-year Levelization Example

A Year	B Capacity Value	C Capacity Value	D % Increase
1	\$0	\$0	
2	\$0	\$0	
3	\$0	\$0	
4	\$0	\$0	
5	\$0	\$0	
6	\$100	\$100	
7	\$100	\$100	
8	\$100	\$100	
9	\$100	\$100	
10	\$100	\$100	
11	\$100	\$100	
12	\$100	\$100	
13	\$100	\$100	
14	\$100	\$100	
15	\$100	\$100	
16		\$100	
17		\$100	
18		\$100	
19		\$100	
20		\$100	

Discount Rate	8.0%	8.0%	
Years	15	20	
Present Value	\$456.68	\$582.54	
Levelized Value	\$53.35	\$59.33	11%

II. REBUTTAL TO DIRECT TESTIMONIES OF JUSTIN R. BARNES

AND R. THOMAS BEACH

Q. INTERVENOR WITNESSES BARNES (PP. 28-30) AND BEACH (PP. 25-26) POINT TO RESILIENCY AS AN ADDITIONAL VALUE OF DER. DO YOU AGREE THAT DER CAN PROVIDE RESILIENCY BENEFITS, AND ARE THERE ANY CAVEATS ASSOCIATED WITH THOSE BENEFITS?

A. I agree that DER could provide resiliency and reliability benefits. Having personally endured multiple multiday outages in California over the past two (2) years due to wildfire risk, I can attest to the high value of avoiding long outages. That said, the benefits of increased resiliency would not occur with solar alone but would require solar paired with battery storage. The Commission should adopt a future Solar Choice Metering Tariff that properly reflects the benefits provided by solar alone and separately recognize the value of other demand responsive technologies such as battery storage. The additional benefits that could be provided by technologies such as battery storage should not be assumed to accrue to any solar installation, but only to those that would have sufficient storage and dispatch capability.

III. REBUTTAL TO DIRECT TESTIMONY OF R. THOMAS BEACH

Q. WITNESS BEACH ASSERTS THAT THE UCT IS THE MOST APPROPRIATE TEST FOR THE IMPACTS ON NON-PARTICIPATING RATEPAYERS (P. 17).

YET IN TABLE 1 ON PAGE 18 OF HIS DIRECT TESTIMONY HE DEFINES THE RIM TEST AS REPRESENTING THE NON-PARTICIPATING RATEPAYERS PERSPECTIVE. WHICH COST EFFECTIVENESS TEST REPRESENTS THE NON-PARTICIPATING RATEPAYER PERSPECTIVE?

A. The RIM test is the correct test to evaluate the impacts of DER on non-participating ratepayers. The difference between the two (2) tests is specifically that the RIM test recognizes that bill reductions for DER participants would increase the rates that would need to be borne by non-participating ratepayers in order to allow the utility to recover its total costs. Bill reductions from DER do not increase total utility costs (that is, the total cost to serve both DER participants and non-participants), so bill reductions are not recognized in the UCT. However, when evaluating the impact of DER on non-participating ratepayers it is necessary to separate the DER participants from the non-participating ratepayers --- and the RIM test correctly does this.

Q. WITNESS BEACH ARGUES THAT USING THE RIM TEST WOULD BE CONTRARY TO SECTION 58-40-20(D) OF THE SOUTH CAROLINA ENERGY FREEDOM ACT (“ACT 62”) BECAUSE IT PENALIZES CUSTOMERS FOR BEHIND-THE-METER USAGE OF SELF-GENERATED ELECTRICITY (P. 16). PLEASE EXPLAIN THE FLAW IN THIS ARGUMENT.

A. Section 58-40-20(D)(2) of Act 62 specifically directs the Commission to consider “the cost of service implications of customer-generators on other customers within the same class...” There is no clause that states that the implications of customer-generator usage consumed behind the meter should be excluded from the cost of service

consideration. Indeed, customer-generators alter participant usage behind the meter and can also export power onto the grid --- and both impacts need to be considered to provide a complete and accurate indication of the implications of customer-sited generation.

Q. WITNESS BEACH CLAIMS THAT THE RIM TEST IS INAPPROPRIATE FOR JUDGING THE MERITS OF A NEWLY ESTABLISHED NEM PROGRAM BECAUSE IT IS BACKWARD LOOKING. HE STATES THAT THE RIM TEST IS INAPPROPRIATE BECAUSE “ANY COST SHIFT MEASURED BY THE RIM TEST IS PRIMARILY A THEORETICAL RE-ALLOCATION OF “SUNK” COSTS THAT THE UTILITIES HAVE ALREADY INCURRED RATHER THAN A FORWARD-LOOKING TEST BASED ON THE INCREMENTAL COSTS.”(PP. 16-17) PLEASE EXPLAIN WHY THIS IS NOT A VALID CONCERN.

A. First, the cost shift is not “theoretical.” The reduction in payments of fixed costs by behind-the-meter solar customers eventually leads to higher rates by other customers, other things being equal. It is ultimately a real cost to non-participants and in the meantime a net revenue reduction to shareholders.

Secondly, Witness Beach argues that the RIM test is inappropriate because it considers sunk costs and is not entirely focused on forward-looking incremental costs. This argument, however, misses the fact that the cost shift is actually a forward-looking incremental cost for non-participants or a forward-looking revenue loss for shareholders. The fact that the cost shift is only imposed because of the installation of behind-the meter solar makes it incremental for the non-participants or shareholders.

1 **Q. WITNESS BEACH PROVIDES THREE (3) REASONS WHY CUSTOMER**
2 **GENERATORS SHOULD NOT BE PLACED INTO THEIR OWN RATE CLASS**
3 **(P. 27). ARE THESE VALID REASONS TO AVOID THE ESTABLISHMENT OF**
4 **A SEPARATE RATE CLASS TREATMENT FOR DER CUSTOMERS IN THIS**
5 **DOCKET?**

6 **A.** No, these are not valid reasons and I address each of Witness Beach's concerns in
7 order below.

8 1. **Evidence required to justify the separation.** Section 58-40-20(D)(2) of Act 62
9 directs the Commission to specifically consider "the cost of service implication of
10 customer generators on other customers within the same class." The study
11 necessary to meet that requirement would be sufficient to allow the Commission to
12 determine whether a DER separate class is appropriate and whether rates designed
13 for a separate DER class or subclass are appropriate.

14 2. **Assumption that customers with DER technologies are significantly different**
15 **from other customers.** Witness Beach has a valid point if we were focusing on
16 other energy efficiency, demand-side management, and DER technologies such as
17 energy efficient lightbulbs. The focus of this docket, however, is the establishment
18 of the foundation for developing a future Solar Choice Metering Tariff for behind-
19 the-meter solar. There is substantial empirical evidence across the nation that

customers with behind-the-meter solar are significantly different from customers without solar in terms of the pattern of electricity drawn from the utility grid².

3. **Unnecessary proliferation of rate classes.** I am unaware of any party that has proposed the need to develop rate classes for every combination of DER technologies. Witness Beach is correct that such proliferation would be unnecessary. However, a separate class for solar technology could be implemented without having to develop separate classes for all other DER technologies. As I state in my direct testimony, the need for separate treatment for solar customers is driven by the dramatically different usage pattern of those customers compared to non-solar customers. Should there be another technology in the future that merits a separate rate class, that could be addressed in the future, but should not restrict the establishment of a solar rate class or subclass in this docket or any future docket.

Q. BASED ON YOUR REVIEW OF THE DIRECT TESTIMONY FILED IN THIS GENERIC DOCKET, DO YOU HAVE ANY ADDITIONAL RECOMMENDATIONS?

A. No. The eleven (11) recommendations offered in my direct testimony remain unchanged based on the information offered by other witnesses in this docket.

² *Solar Adoption and Energy Consumption in the United States*, 2012, McAllister, UC Berkeley PhD Thesis, <https://escholarship.org/uc/item/8tz503nh#main>
Demand rate impacts on residential rooftop solar customers, 2018, Carrol, The Electricity Journal, <https://www.sciencedirect.com/science/article/pii/S1040619018302197>
9% of solar homes are doing something utilities love, 2014, Fisher, OPower blog series, <https://blogs.oracle.com/utilities/solar-homes-utilities-love>

1 **Q. WILL YOU UPDATE YOUR TESTIMONY BASED ON INFORMATION THAT**
2 **BECOMES AVAILABLE?**

3 **A.**Yes. ORS fully reserves the right to revise its recommendations via supplemental
4 testimony should new information not previously provided by the Company, or other
5 sources, becomes available.

6 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

7 **A.**Yes.